



**Department of
Environmental Protection
Bureau of Land & Water Quality July 2004
O&M Newsletter**

A monthly newsletter for wastewater discharge licensees, treatment facility operators, and associated persons

Is it plugged in? Is it turned on?

We have seen an increasing number of overflows from pump stations and other similar events caused by operators or contractors forgetting to turn a piece of equipment back on after it has taken off-line for maintenance. We know that wastewater operators are faced with more and more things to do in the time they have available at the plant each day. That makes it especially important to write a checklist or other reminder for yourself or the to make sure that the equipment being worked on is put back in service after the work is done.

Common safety procedures require that any mechanical equipment be locked out and tagged out before it is worked on. The lock-out/tag-out may be done by someone other than the person actually performing the work. That worker may not be aware that he or she should notify someone when the work is completed so that the equipment can be re-energized and made ready to be put back on line. If the worker doing the maintenance is not the person who does the lock-out/tag out, he/she should be told, in writing on the work order, that it is his/her responsibility to inform a shift operator or other person of authority that the work has been completed and the equipment can be put back in service. If lock-out/tag-out is the maintenance worker's responsibility, the work order should state that it is the worker's responsibility to make sure the equipment is back in service after the maintenance work is finished.

Equipment controlled by SCADA systems is not necessarily immune to this problem. Although you would think that the SCADA system would send a high water alarm if the main pump in a pump station was not functioning, some of the

systems must be manually reset if the piece of equipment controlled by the SCADA system is manually taken off line for maintenance. A worker may see a dangerous condition and throw a manual shut-off switch without knowing that taking the equipment off line manually will inactivate the SCADA control of that equipment until the SCADA is reset. He/she may do the work necessary to fix the problem and may manually "turn on" the equipment but not know that the SCADA system must also be reset for the equipment to function properly.

The bottom line is... when a piece of equipment is turned off for preventive or emergency maintenance, it is vital to make sure that the equipment is turned back on and is functioning properly. Whether you use a checklist on the work order, a separate reminder note or a string tied on your finger, make sure that everyone in your plant who works on equipment, be it one of your staff or an outside contractor, is reminded to turn equipment back on after completing any maintenance job. Just make sure everyone asks themselves... "Is it plugged in? Is it turned on?"

Richard Darling

Certification News

The Fall 2004 wastewater operator certification exam will be given on November 10, 2004 in the usual locations. Applications for the November exam must be postmarked by September 25, 2004 or hand-delivered to the DEP Augusta office on September 27, 2004.

Spring Exam Statistics

The following are the pass/fail rates for the Spring 2004 exam

Grade	Pass/Fail	Percent passed
1PC	0/1	0.0%
1B	6/10	60.0%
2B	8/2	80.0%
3B	6/6	50.0%
4B	2/3	40.0%
5B	2/8	20.0%

For Practice

Please Note: "For Practice" took a vacation in June and so we're publishing 8 questions this month to make up the shortfall.

- The Mean Cell Residence Time (MCRT) is
 - The length of time an average microbe spends in the aeration basin.
 - The length of time an average microbe spends in the secondary clarifier and return sludge line.
 - The length of time an average microbe spends in the treatment system before being wasted or lost in the effluent.
 - The ratio of the solids in the aeration basin to the solids in the primary effluent.
- The term most commonly used for untreated wastewater is
 - Raw
 - Septic
 - Ground
 - Aerobic
- The letters MSDS stand for:
 - Maine Safety Determination Specifications
 - Material Safety Data Sheet
 - Materials Source and Delivery Sheet
 - Management Specifications for Determining Safety
- If a chemical feed pump will supply a maximum of 32,500 pounds per day, what is the maximum feed rate in gallons per minute?
 - 0.82 gpm
 - 1.34 gpm
 - 2.08 gpm
 - 3.54 gpm
- The unit of electrical power is
 - The coulomb
 - The watt
 - The amp
 - The volt
- The most important test to run to determine if an anaerobic digester is working properly is:
 - BOD, suspended solids and settleable solids
 - pH, alkalinity, and settleable solids
 - Volatile acid/alkalinity relationships
 - DO, volatile solids, and BOD
- How long must laboratory records and reporting forms that show the quality of the influent and effluent be kept?
 - forever
 - 7 years
 - 5 years
 - 3 years
- A rectangular flume is 18 inches wide and 24 inches deep. If the flume is full of water flowing at 2 feet per second, how much water is flowing through the flume?
 - 0.78 MGD
 - 1.94 MGD
 - 3.27 MGD
 - 5.93 MGD

Approved Training

August 11, 2004 in Portland ME – Activated Sludge – Sponsored by Penn State Univ. – 814-863-6106 – Approved for 6 hours

August 12, 2004 in Portland ME – Biological Nutrient Removal – Sponsored by Penn State Univ. – 814-863-6106 – Approved for 6 hours

Please note: The Fall training schedules for JETCC, MRWA and NEIWPCC are being developed at this time. The next issue of the O&M News should have information on the courses that will be offered by those organizations in the fall.

Answers to *For Practice*:

1. c. The Mean Cell Residence Time is the amount of time a typical biomass cell spends in the treatment system, including the aeration basins, clarifiers and return lines, before it is removed by wasting or loss in the effluent.
2. a. Untreated wastewater is called Raw Wastewater.
3. b. MSDS stands for Material Safety Data Sheet
4. c. The pump delivers 32,500 pounds/day which is 1,354.17 pounds/hour or 22.57 pounds/minute. 1 gallon weighs 8.34 pounds so the feed rate is $22.57/8.34 = 2.71$ gallons/minute.
5. b. The unit used to designate electrical power is the watt.
6. c. In order for an anaerobic digester to work properly, there must be a balance between the organic acids produced by the anaerobic bacteria and the alkalinity of the sludge. The methane forming bacteria use the organic acids for food, but if there is not enough alkalinity to buffer the digester, it becomes too acidic and the methane producing bacteria are inhibited.
7. d. Records of the characteristics of the facility's influent and effluent must be kept for 3 years.
8. b. The area of the flume is 1.5 foot X 2.0 foot = 3.0 square feet. If the water flows in the flume at 2 feet per second, the flume delivers 3.0 square feet X 2 feet/Second = 6 cubic feet/second (cfs) of flow. 1.55 cfs = 1 MGD. Therefore the flume delivers 6.0 cfs/1.55 cfs/MGD = 3.87 MGD.

Bypasses and Upsets-When are They Allowed?

According to Section B.4. of the Standard Conditions Applicable to All Permits, "The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment." Under some conditions, however, bypasses and upsets are allowed and are not considered violations of a permit.

Bypasses

According to Section B.5. of the Standard Conditions, a bypass is defined as “the intentional diversion of waste streams from any portion of a treatment facility.” Bypasses are generally prohibited unless:

- (1) The bypass was unavoidable to prevent loss of life, personal injury or severe property damage;
- (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,
- (3) The permittee notified the Department within twenty four (24) hours after becoming aware of an unanticipated bypass or, if possible, within ten (10) days prior to the date of the bypass.

Bypasses are also permitted if effluent limits are not exceeded and if the bypass is for essential maintenance to assure efficient operation of the wastewater treatment facility. Such bypasses do not need to be reported to the Department.

Upsets

According to Section B.6. of the Standard Conditions, an upset is defined as “an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent

caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.” If an upset occurs, the permittee seeking to establish the occurrence of a permitted upset has the burden of proof in any enforcement proceeding. An upset may be permitted if the permittee demonstrates through properly signed, contemporaneous operating logs or other relevant evidence that:

- (1) An upset occurred and the cause is identified;
- (2) The permitted facility was at the time being properly operated;
- (3) The permittee notified the Department within twenty four (24) hours of becoming aware of the upset; and,
- (4) The permittee took all reasonable steps to minimize or prevent any discharge which had a reasonable likelihood of adversely affecting human health or the environment.

John Glowa